

COURSE SYLLABUS

A. Overview

Course Description	<p>This is an applied research methods course. It provides a foundation for using econometric methods using secondary datasets to investigate research questions in health services. The course builds on knowledge and skills in conceptual models, study designs, literature review, data acquisition and data management, and statistics gained in the prerequisite courses. This course was originally developed by Susan Ettner, with a number of topics prepared and updated by Ninez Ponce, Jack Needleman, Fred Zimmerman and Jerry Kominski. The syllabus, selection of readings, and data sets, assignments and class presentations draw heavily on materials developed by Drs. Ettner and Needleman and are used with their permission.</p> <p>There are a vast number of advanced techniques and all cannot be covered in 10 weeks. Topics were selected in coordination with instructors for the HPM and Biostatistics course prerequisites and will focus on application to health services research.</p>
Prerequisites	HPM 225A/B, HPM 226 A/B; BIOSTAT 201A/B
Instructor	<p>W. Scott Comulada Associate Professor-in-Residence Department of Psychiatry and Biobehavioral Sciences, David Geffen SOM Department of Health Policy and Management, Fielding SPH Office: 10920 Wilshire Blvd Suite 350 (Wilshire Center) Phone: 310-794-0938 Email: wcomulada@mednet.ucla.edu</p>
TAs	<p>Ellie Albertson, MS, MPH, PhD Candidate elalb@g.ucla.edu Dahai Yue, MS, PhD Candidate dhyue@g.ucla.edu</p>
Online Stata Resources	<p>https://www.stata.com/nc101-uclahpm Username: nc101-uclahpm Password: 3mb9flVo</p>
Class Days, Times, Location	<p>Tuesdays and Thursdays; Class: 1pm-2:50pm; Lab: 3pm-3:50pm Location: Virtual</p>
Office Hours	Contact instructor / TAs to set up virtual appointments with them
Course Texts	<p>1. Rabe-Hesketh and Skrondal. Multilevel & Longitudinal Modeling Using Stata, 3rd edition. STATA 2012.</p>

(NOTE: The authors are the developers of GLLAMM (www.gllamm.org), an ado command within STATA used for multilevel model estimation. However, we will not cover GLLAMM in this course. This is a two-volume book.)

2. Freese J. & Long J.S., Regression Models for Categorical Dependent Variables Using Stata, 3rd Edition, College Station, TX: Stata Press, 2014. (NOTE: My goto book for nearly all models except multilevel, and selection models. Great ado files for postestimation.)
3. Angrist, J.D. & Pischke, J-S. Mostly Harmless Econometrics: An Empiricist's Companion. Princeton, NJ: Princeton University Press, 2009.
4. Wooldridge, Jeffrey M. Introductory Econometrics, A modern approach. 5th Edition. South-Western College Publishing, 2013.

(Note: A solid comprehensive intro econometrics textbook, but not so many examples relating to health or health services.) (Note: This is the only book that is not available through the UCLA Health Sciences Bookstore. Paperback and electronic editions of this book are available for purchase on www.amazon.com.)

5. Kennedy, Peter, A Guide to Econometrics, 5th Edition, Cambridge, MA: MIT Press, 2003. (Note: a 6th edition is available. Either edition is fine. My favorite econometrics textbook conceptual, wittily written. NP)
6. Long, Scott J. Regression Models for Categorical and Limited Dependent Variables. Advanced Quantitative Techniques in the Social Sciences Series Volume 7. Thousand Oaks, CA: Sage Publications, Inc., 1997. (Note: an enduring classic book if you want to know more about logits, ordered logits and multinomial logits.)
7. Guo SY, Fraser FW. Propensity Score Matching: Statistical Methods and Applications. SAGE 2009. (Note: The title belies coverage of alternative specifications to propensity scores for purging the selection bias that plagues observational studies. This book includes relevant chapters for the causal inference module. Hardcover book available for rent from Amazon.com)
8. Hilbe, Joseph Negative Binomial Regression, 2nd edition. Cambridge University Press, 2007/8. (Electronic version of book available from Amazon.com)
9. Jones, A.M., Rice, N., Bago dUva, T. and Balia, S. Applied Health Economics, Second Edition. Routledge, 2013.

Required Readings

10. Imbens, G.W., Rubin, D.B. Causal Inference in Statistics, Social, and Biomedical Sciences: An Introduction Cambridge University Press, 2015.

11. Rabe-Hesketh, S., & Everitt, B. Handbook Of Statistical Analyses Using Stata, 4th edition Taylor & Francis Group, 2007.

See table on readings at end of document.

Course Format

Two two-hour lectures per week and one-hour labs for most lectures.

Classroom Participation & Attendance	Student participation will be measured during each lecture by asking questions and participation in class discussions during lectures.
UCLA ADA Policy	Students needing academic accommodations based on a disability should contact the Center for Accessible Education (CAE) at (310) 825-1501 or in person at Murphy Hall A255. When possible, students should contact the CAE within the first two weeks of the term as reasonable notice is needed to coordinate accommodations. For more information visit www.cae.ucla.edu .
ADA Contact	Nickey Woods Center for Accessible Education A255 Murphy Hall Phone: (310) 825-1501 TTY / TTD: (310) 206-6083 Fax: (310) 825-9656
Inclusivity	UCLA's Office for Equity, Diversity, and Inclusion provides resources, events, and information about current initiatives at UCLA to support equality for all members of the UCLA community. I hope that you will communicate with me or your TA if you experience anything in this course that does not support an inclusive environment, and you can also report any incidents you may witness or experience on campus to the Office of Equity, Diversity, and Inclusion on their website (https://equity.ucla.edu/).

B. Learning Objectives

Council on Education for Public Health (CEPH) areas of foundational knowledge are addressed in this course using the learning objectives listed below along with the assessment that will evaluate students' attainment of these objectives.

CEPH Learning Experiences/Course Learning Objectives	Assessment
Design a research study to evaluate research questions in the areas of health policy, medical care, population health, health services research or related areas.	Term paper in the form of a manuscript that would typically be submitted for peer-reviewed publication

C. Course Assignments & Exams

1. Outline of proposed term paper topic
2. Homework 1 covering Module 1 topics on the analysis of dependent variables with skewed distributions
3. Draft of Table 1 for term paper
4. Homework 2 covering Module 2 topics on causal inference
5. Final version of Table 1 for term paper
6. Homework 3 covering Module 3 topics on the analysis of clustered and panel data
7. Term paper

Grading:

- 5% Class participation / attendance
- 45% Three group homework assignments
- 50% A solo-written term paper

Grading Scale:

Grade Point:	4.0	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0
Final Percentage :	100-98	97-93	92-90	89-88	87-83	82-80	79-78	77-73	72-70	69-68	67-63	62-60	<60
Letter Grade:	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

Course Exams Schedule

No exams or quizzes will be administered for this course.

D. Course Policies & UCLA Policies

Message about Academic Integrity to all UCLA Students from UCLA Dean of

Students: UCLA is a community of scholars. In this community, all members including faculty, staff and students alike are responsible for maintaining standards of academic honesty. As a student and member of the University community, you are here to get an education and are, therefore, expected to demonstrate integrity in your academic endeavors. You are evaluated on your own merits. Cheating, plagiarism, collaborative work, multiple submissions without the permission of the professor, or other kinds of academic dishonesty are considered unacceptable behavior and will result in formal disciplinary proceedings usually resulting in **suspension** or **dismissal**.

Forms of Academic Dishonesty: As specified in the UCLA Student Conduct Code, violations or attempted violations of academic dishonesty include, but are not limited to, cheating, fabrication, plagiarism, multiple submissions or facilitating academic dishonesty:

Cheating: Unauthorized acquiring of knowledge of an examination or part of an examination

- Allowing another person to take a quiz, exam, or similar evaluation for you
- Using unauthorized material, information, or study aids in any academic exercise or examination – textbook, notes, formula list, calculator, etc.
- Unauthorized collaboration in providing or requesting assistance, such as sharing information
- Unauthorized use of someone else's data in completing a computer exercise
- Altering a graded exam or assignment and requesting that it be regraded

Plagiarism: Presenting another's words or ideas as if they were one's own

- Submitting as your own through purchase or otherwise, part of or an entire work produced verbatim by someone else
- Paraphrasing ideas, data or writing without properly acknowledging the source
- Unauthorized transfer and use of someone else's computer file as your own
- Unauthorized use of someone else's data in completing a computer exercise

Multiple Submissions: Submitting the same work (with exact or similar content) in more than one class without permission from the instructor to do so. This includes courses you are currently taking, as well as courses you might take in another quarter

Facilitating Academic Dishonesty: Participating in any action that compromises the integrity of the academic standards of the University; assisting another to commit an act of academic dishonesty

- Taking a quiz, exam, or similar evaluation in place of another person
- Allowing another student to copy from you
- Providing material or other information to another student with knowledge that such assistance could be used in any of the

violations stated above (e.g., giving test information to students in other discussion sections of the same course)

Fabrication: Falsification or invention of any information in an academic exercise

- Altering data to support research
- Presenting results from research that was not performed
- Crediting source material that was not used for research

While you are here at UCLA, if you are unsure whether what you are considering doing is cheating, **don't take chances**, ask your professor. In addition, avoid placing yourself in situations which might lead your professor to **suspect you of cheating**.

Alternatives to Academic Dishonesty

- **Seek out help** – Meet with your professor, ask for assistance as needed.
- **Ask for an extension** – if you explain your situation to your professor, she/he might be able to grant you an extended deadline for an upcoming assignment.
- **See a counselor** at Student Psychological Services, and/or your school, college or department – UCLA has many resources for students who are feeling the stresses of academic and personal pressures.

If you would like more information, please come see us at the Dean of Students' Office in 1206 Murphy Hall, call us at (310) 825-3871 or visit their website at www.deanofstudents.ucla.edu.

E. Course Outline

This schedule may change as the semester progresses, according to student enrollment and needs.

Dates	Week	TOPIC	Lab Schedule	Assignments / Assigned	Assignments / Due Dates
Module 1: Skewed Distribution of Dependent Variables					
3/31	1	Introduction, Ground Rules, OLS, and Violations	STATA MARGINS / Bootstrap RR and RD	Proposed Term Paper Topic	
4/2		Quantile Regression / Transformations and Retransformations	Quantile Regression	Homework 1	
4/7	2	Generalized Linear Models (GLM) / Two-Part Models	Transformations and Retransformations		
Module 2: Causal Inference					
4/9		Sample Selection Models: Heckman	GLM	Term Paper Table 1	Proposed Paper Topic
4/14	3	No lecture	Two-Part Models	Homework 2	
4/16		Structural Equation Modeling: Dr. Heather Gunn ^a	Heckman Model		
4/21	4	Treatment Effects	Treatment Effects		Homework 1
4/23		Propensity Scores	Propensity Scores		
4/28	5	Instrumental Variables (IV)	Instrumental Variables		Table 1 Draft
4/30		Non-linear IV	Non-linear IV		
5/5	6	Review of Modules 1 and 2	NO LAB		
Module 3: Clustered / Longitudinal (Panel) Data					
5/7		Fixed Effects / Difference-in-Difference (DID) ^b	Fixed Effects	Homework 3	

Dates	Week	TOPIC	Lab Schedule	Assignments / Assigned	Assignments / Due Dates
5/12	7	Random Effects / Multilevel Models	Random Effects		Homework 2
5/14		Marginal Models / Generalized Estimating Equations (GEE)	Multilevel Models		Table 1 Final
5/19	8	Covariance Structure Modeling ^c	GEE		
5/21		Mean Structure ^c	NO LAB		
5/26	9	Bayesian Analysis: ^c Dr. Chuck Huber	NO LAB		
5/28		Review of course & paper topics	NO LAB		Homework 3
6/2	10	OPEN OFFICE HOURS	NO LAB		
6/4		OPEN OFFICE HOURS	NO LAB		
6/9,11		FINALS WEEK / NO CLASS	NO LAB		Term paper Due 6/12, 11:59pm

^a No lab for SEM.

^b Handout with Stata code posted on CCLE in lieu of lab on DID.

^c No labs for these topics.

Textbook readings and articles are provided below to help you assimilate the materials presented in class and lab. I also encourage you to use articles from this list as references for your class papers. Please do not cite my lectures or the lab handouts when you present methodological issues in your final papers. Instead, cite from the list below or a published book/article. The list also provides examples of applied empirical work using one or a combination of models taught in this class. Students have found the readings most useful once they have decided on a research question and narrowed down the candidate estimation strategies to answer their question.

Date / Topic	Readings
3/31 Introduction, Ground Rules, OLS, and Violations	1- Lumley T, Diehr P, Emerson S, Chen L. The importance of the normality assumption in large public health data sets. <i>Annu Rev Public Health</i> 2002; 23: 151-69. http://rctdesign.org/TechReports/ARPHnonnormality.pdf 2- Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. <i>Journal of the American Medical Association</i> 1998; 280(19): 1690-1691. http://jama.jamanetwork.com/data/Journals/JAMA/4584/JSC80400.pdf 3- Rabe-Hesketh Multilevel & Longitudinal Modeling Using Stata, 3 rd edition. STATA 2013: Part 1 "Preliminaries" (posted on CCLE)

<p>4/2 Quantile Regression</p>	<p>1- Bind, M and Coad, A. From Average Joe's happiness to Miserable Jane and Cheerful John: using quantile regressions to analyze the full subjective well-being distribution. Journal of Economic Behavior & Organization, 2011; 79(3): 275-290. http://pdn.sciencedirect.com/science?_ob=MiamiImageURL&cid=271649&http://pdn.sciencedirect.com/science?_ob=MiamiImageURL&cid=271649&user=4423&pii=S0167268111000692&check=y&origin=article&zone=toolbar&coverDate=2011--31&view=c&originContentFamily=serial&wchp=dGLbVIVzSkWb&md5=c10e3a23e2508b831ba71a94063f676d&pid=1-s2.0-S0167268111000692main.pdf</p> <p>2- Koenker R, Hallock KF. Quantile Regression: An Introduction. Journal of Economic Perspectives. 2001, Vol 15, No. 4, pp.143-156. http://www.econ.uiuc.edu/~roger/research/intro/rq3.pdf</p> <p>3- Buchinsky M. Recent Advances in Quantile Regression Models: A Practical Guideline for Empirical Research. The Journal of Human Resources, Winter 1998, 33(1): 88-126. http://www.jstor.org/stable/pdfplus/146316.pdf?acceptTC=true</p> <p>4- Abrevaya J. The Effects of Demographics and Maternal Behavior on the Distribution of Birth Outcomes. 2001, Vol. 26, pp.247-257. http://link.springer.com/article/10.1007/s001810000052</p> <p>5- Angrist, J.D. & Pischke, J-S. Mostly Harmless Econometrics: An Empiricist's Companion. Princeton, NJ: Princeton University Press, 2009. Chapter 7.</p>
<p>4/2 Transformations and Retransformations</p>	<p>1- Manning, W. "The Logged Dependent Variable, Heteroskedasticity, and the Retransformation Problem." Journal of Health Economics, 1998; 17(3): 283-295. http://www.sciencedirect.com/science/article/pii/S0167629698000253</p> <p>2- Duan, N. "Smearing Estimate: A Nonparametric Retransformation Method." Journal of the American Statistical Association, 1983; 78(383): 605-610. http://www.jstor.org/stable/pdfplus/2288126.pdf?acceptTC=true</p> <p>3- Ai, C. and E. Norton. "Standard Errors for the Retransformation Problem with Heteroskedasticity." Journal of Health Economics, 2000; 19(5): 697-718. http://www.sciencedirect.com/science/article/pii/S0167629600000461</p>

<p>4/7</p> <p>Generalized Linear Models (GLM) and Count Data Models: Review and HSR Applications</p>	<p>GLM Readings:</p> <p>1- Buntin MB, Zaslavsky AM. Too much ado about two-part models and transformation? Comparing methods of modeling Medicare expenditures. Journal of Health Economics. 2004 May; 23(3): 525-42. http://www.sciencedirect.com/science/article/pii/S0167629604000220</p> <p>2- Rabe-Hesketh, Sophia, Everitt Brian. Handbook of Statistical Analyses Using Stata, 4th edition. Taylor & Francis Group, 2007. Chapter 7.</p> <p>Count Data Model Readings:</p> <p>1- Freese J. & Long J.S., Regression Models for Categorical Dependent Variables Using Stata, 2nd Edition, College Station, TX: Stata Press, 2006. Chapter 8.</p> <p>2- Hidayat B, Pokhrel S. The Selection of an Appropriate Count Data Model for Modelling Health Insurance and Health Care Demand: Case of Indonesia. International Journal of Environmental Research and Public Health. 2010; (7): 9-17. http://www.mdpi.com/1660-4601/7/1/9/pdf</p> <p>If you are considering multilevel count models: Rabe-Hesketh Multilevel & Longitudinal Modeling Using Stata, 3rd edition. STATA 2012. Chapter 13.</p> <p>Hilbe, Joseph. Negative Binomial Regression, 2nd edition. Cambridge U. Press, 2007/2008: Chapters 1-4: overview of count models; Chapter 9 compares NB vs. Poisson; Chapter 11 covers ZINB; Chapter 13.2.1 and 13.2.2, on endogeneity and 2SLS approach; Chapter 14 on count panel models (best to read after random intercept and random slope lectures).</p> <p>3- Kenkel, D. & Terza, J. (2001). "The Effect of Physician Advice on Alcohol Consumption: Count Regression with an Endogeneous Treatment Effect." Journal of Applied Econometrics, 16, 165-184. (An example of count model with instrumental variables.) http://www.jstor.org/stable/pdfplus/2678515.pdf</p>
--	--

<p>4/7 Two-Part Models</p>	<p>1- Duan, N., W. Manning, C. Morris, J. Newhouse. "A Comparison of Alternative Models for the Demand for Medical Care." Journal of Business and Economic Statistics, 1983; 1(2): 115-126 http://www.jstor.org/stable/pdfplus/1391852.pdf</p> <p>5- Mullahy, J. "Much Ado about Two: Reconsidering Retransformation and the Two-Part Model in Health Econometrics." Journal of Health Economics, 1998; 17(3): 247-281. http://www.sciencedirect.com/science/article/pii/S0167629698000307</p>
<p>4/9 Sample Selection Models</p>	<p>1- Heckman, J. Sample Selection Bias as a Specification Error. Econometrica 1979. 47(1): 153-161. http://www.jstor.org/stable/pdfplus/1912352.pdf</p> <p>2- Grasdal A. "The Performance of Sample Selection Estimators to Control for Attrition Bias." Health Economics 2001; 10(5): 385-398. http://onlinelibrary.wiley.com/doi/10.1002/hec.628/pdf</p> <p>3- Benson K. Hartz, AJ. A Comparison of Observational Studies and Randomized, Controlled Trials. New England Journal of Medicine 2000; 342: 2878-1886. http://www.nejm.org/doi/pdf/10.1056/NEJM200006223422506</p>
<p>4/21 Treatment Effects</p>	<p>1- Feng W, Zhou W, Butler JS, Booth BM, French MT. "The Impact of Problem Drinking on Employment." Health Economics 2001; 10(6): 509-521. http://onlinelibrary.wiley.com/doi/10.1002/hec.611/pdf</p> <p>2- Crown W., R. Obenchain, L. Englehart, T. Lair, D. Buesching and T. Croghan. "The Application of Sample Selection Models to Outcomes Research: The Case of Evaluating the Effect of Antidepressant Therapy on Resource Utilization." Statistics in Medicine 1998; 17(17): 1943-1958. http://onlinelibrary.wiley.com/doi/10.1002/%28SICI%2910970258%2819980915%2917:17%3C1943::AID-SIM885%3E3.0.CO;2-0/pdf</p>

<p>4/23 Propensity Scores</p>	<p>1- Becker SO and Ichino A. "Estimation of Average Treatment Effects Based on Propensity Scores." The Stata Journal 2002; 2(4): 358-377. http://www.stata-journal.com/sjpdf.html?articlenum=st0026</p> <p>2- Black DA, Smith JA. "How Robust is the Evidence on the Effects of College Quality? Evidence from Matching." Journal of Econometrics 2004; 121(1-2): 99-124. http://faculty.smu.edu/Millimet/classes/eco7377/papers/black%20smith.pdf</p> <p>3- Lightfoot M, Rotheram-Borus MJ, Comulada WS, Reddy V, & Duan N (2010). Efficacy of brief interventions in clinical care settings for persons living with HIV. JAIDS. 53(3): 34856 (Posted on CCLE).</p>
<p>4/28 Instrumental Variables</p>	<p>1- Terza J., Bradford WD, & Dismuke CE. (2008). "The Use of Linear Instrumental Variables Methods in Health Services Research and Health Economics: A Cautionary Note." Health Services Research, 43, 1102-1120. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2442231/pdf/hesr0043-1102.pdf</p> <p>2- Harris, K and D. Remler. "Who is the Marginal Patient? Understanding Instrumental Variables Estimates of Treatment Effects." Health Services Research, 1998; 33(5): 1337-1360. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1070319/pdf/hsresearch00030-0163.pdf</p> <p>3- Stukel TA, Fisher ES, Wennberg DE, Alter DA, Gottlieb DJ, Vermeulen MJ. "Analysis of Observational Studies in the Presence of Treatment Selection Bias: Effects of Invasive Cardiac Management on AMI Survival Using Propensity Score and Instrumental Variable Methods." Journal of the American Medical Association 2007; 297(3): 278-285. http://jama.jamanetwork.com/data/Journals/JAMA/5092/joc60185_278_285.pdf</p>

<p>4/30 Non-linear Instrumental Variables</p>	<p>1- Bhattacharya J, Goldman D, McCaffrey D. "Estimating Probit Models with Self-Selected Treatments." <i>Statistics in Medicine</i> 2006; 25: 389-413. http://onlinelibrary.wiley.com/doi/10.1002/sim.2226/pdf</p> <p>2- Hadley J, Polsky D, Mandelblatt JS, Mitchell JM, Weeks JC, Wang Q, Hwang Y, and the OPTIONS Research Team. "An Exploratory Instrumental Variable Analysis of the Outcomes of Localized Breast Cancer Treatments in a Medicare Population." <i>Health Economics</i> 2003; 12(3): 171-186. http://web.ntpu.edu.tw/~hwangyt/publications/Anexploratoryinstrumentalvariableanalysis.pdf</p> <p>3- Mullahy J. (1997). "Instrumental-Variable Estimation of Count Data Models: Applications to Models of Cigarette Smoking Behavior." <i>Review of Economics and Statistics</i>, 79, 586-593. http://www.jstor.org/stable/pdfplus/2951410.pdf?acceptTC=true</p>
<p>5/7 Fixed Effects</p>	<p>1- Ellis R, McGuire T. Hospital response to prospective payment: Moral hazard, selection and practice-style effects. <i>Journal of Health Economics</i>, 1996. (15) 257-277. http://www.sciencedirect.com/science/article/pii/0167629696000021</p> <p>2- Grazier K, Pollack H. Translating Behavioral Health Services Research into Benefits Policy. <i>Medical Care Research and Review</i>, Vol. 57 Supplement 2, (2000); 53-71. http://journals.sagepub.com/doi/pdf/10.1177/1077558700057002S04</p> <p>3-Lichter DT, McLaughlin DK, Ribar DC. State abortion policy, geographic access to abortion providers and changing family formation. <i>Fam Plan Perspect</i> 1998; 30(6): 281-7. http://www.jstor.org/stable/pdfplus/2991504.pdf</p>

<p>5/12 Random Effects</p>	<p>1- Rabe-Hesketh Multilevel & Longitudinal Modeling Using Stata, 3rd edition. STATA 2012. Chapters 2.4, 3.7.5, 3.8, 3.10, 3.11</p> <p>2- Amy J. Schulz, Clarence C. Gravlee, David R. Williams, Barbara A. Israel, Graciela Mentz, and Zachary Rowe. Discrimination, Symptoms of Depression, and Self-Rated Health Among African American Women in Detroit: Results from a Longitudinal Analysis. American Journal of Public Health July, 2006; 96(7): 1265-1270. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1483853/pdf/0961265.pdf</p> <p>3- Baxter-Jones AD, Cardy AH, Helms PJ, Phillips DO, Smith WC. Influence of socioeconomic conditions on growth in infancy: the 1921 Aberdeen birth cohort. Arch Dis Child 1999; 81(1): 5-9. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1717981/pdf/v081p00005.pdf</p>
--------------------------------	--

<p>5/12 Multilevel Models</p>	<p>For Random Intercept: Rabe-Hesketh Multilevel & Longitudinal Modeling Using Stata, 3rd edition. STATA 2012. Chapters 2.3 – 2.7.2, 2.9.1, 2.10, 3.1 – 3.11 (skip glamm)</p> <p>For Random Coefficient: Rabe-Hesketh Multilevel & Longitudinal Modeling Using Stata, 3rd ed. STATA 2012. Chapters 4.1 – 4.11 (skip glamm and empirical bayes sections)</p> <p>For Non-Linear Multilevel Models (Random Intercept and Random Coefficient Models): Rabe-Hesketh Multilevel & Longitudinal Modeling Using Stata, 3rd edition. STATA 2012. Chapters 10.6 – 10.14, 11.6 – 11.13, 13.7 – 13.16, 15.9 – 15.12</p> <p>1- Sullivan LM, Dukes KA, Losina E. “An Introduction to Hierarchical Linear Modeling.” <i>Statistics in Medicine</i> 1999; 18(7): 855-888. http://onlinelibrary.wiley.com/doi/10.1002/(SICI)10970258(19990415)18:7%3C855::AID-SIM117%3E3.0.CO;2-7/epdf</p> <p>2- Diez Roux AV. “A Glossary for Multilevel Analysis.” <i>Journal of Epidemiology and Community Health</i> 2002; 56: 588-594. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1732212/pdf/v056p00588.pdf</p> <p>3- Rice N, Jones A. “Multilevel Models and Health Economics.” <i>Health Economics</i> 1997; 6(6): 561-575. http://onlinelibrary.wiley.com/doi/10.1002/(SICI)10991050(199711)6:6%3C561::AID-HEC288%3E3.0.CO;2-X/abstract</p> <p>4- Subramanian SV, Jones K, Duncan C. “Multilevel methods for public health research.” In Kawachi I and Berkman L, editors. <i>Neighbors and Health</i>. 2003. New York: Oxford University Press, 65-111. Posted on CCLE</p>
-----------------------------------	--

<p>5/14</p> <p>Generalized Estimating Equations</p>	<p>1- Killip S, Mahfoud Z, Pearce K. What is an intraclass correlation coefficient? Crucial concepts for primary care researchers. <i>Annals of Family Medicine</i>. 2004 May-Jun; 2(3): 204-8.</p> <p>http://www.annfammed.org/content/2/3/204.full.pdf+html</p> <p>2- Ghisletta P, Spini D. An introduction to generalized estimating equations and an application to assess selectivity effects in a longitudinal study on very old individuals. <i>Journal of Behavioral and Educational Statistics</i>. 2004; 29(4): 421.</p> <p>http://www.jstor.org/stable/pdfplus/3701330.pdf</p> <p>3- Liang KY, Zeger SL. Regression analysis for correlated data. <i>Annual Review of Public Health</i>. 1993; 14: 43-68.</p> <p>http://www.annualreviews.org/doi/pdf/10.1146/annurev.pu.14.050193.000355</p>
---	--